forest research note

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# Collection of Spruce Cuttings for Vegetative Propagation

by

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Vegetative propagation by rooting cuttings is a method of asexual reproduction by which genetically identical trees (clones) can be produced. Although this method is commonly used to mass produce clonal stock of poplars, only recently has it been considered for mass production of spruce. In the early 1970s, Finland and Germany started mass producing their best selections of *Picea abies* (L.) Karst. In Ontario, small scale rooting trials of black (*P. mariana* (Mill.) B.S.P.) and white spruce (*P. glauca* (Moench) Voss) were initiated at Maple in 1968, and the work was expanded in 1973 when a mist house was built at the Orono nursery.

This note is a step-by-step guide for collection of cuttings from either nursery stools or trees in the field.

## *Materials Required*

Sharp cutting tool (scalpel, knife or secateurs), sharpening stone or replacement scalpel blades, alcohol or gum-solvent, adhesive bandages, labelling tags, indelible marking pen, flagging tape, wet peat moss, small plastic bags (about 15 x 25 cm), large plastic bags (about 60 x 90 cm), cooler, ice bags and elastic bands.

## *Time of Collection*

Since cuttings taken prior to bud break in the early spring have rooted the best, the recommended time for collection of cuttings in Ontario is normally around mid-April in the south and early May in the north. Collection and handling of dormant cuttings are easier at this time of year and manpower is available before the planting season.

Ontario Ministry of Natural Resources

Hon. Frank S. Miller
Minister

Dr. J.K. Reynolds
Deputy Minister

A communication of the Forest Research Branch to aid management of Ontario's forest land resource. Further information may be obtained from The Director, Forest Research Branch, Ministry of Natural Resources, Maple, Ontario L0J 1E0

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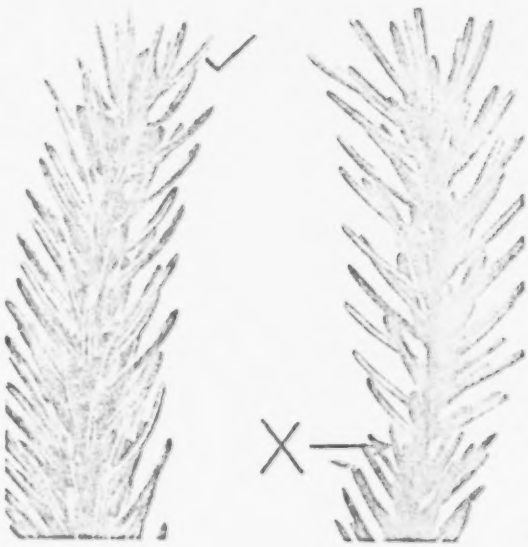


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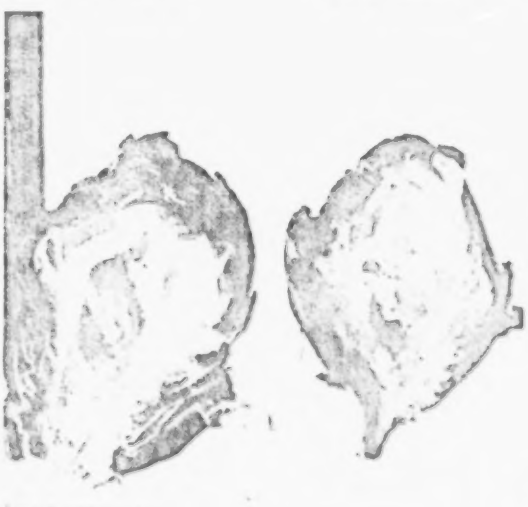

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*Tree Selection*

In the Ontario super-seedling selection programme, all the trees in the nursery stools are eligible.

In natural stands and plantations, young superior trees are to be considered. These trees must be less than 20 years old; vigorous, with above-average height growth; with at least average diameter; with good form and branching habit; and free of disease.

*Labelling of Selected Trees*

Super-seedling selections in the nursery are already labelled.

Trees selected in the field should be labelled with a permanent tag (Fig. 1) using a consecutive number series. Districts must keep track of tree numbers used, so that in subsequent years the numbers are not duplicated. Place the label on a branch about 2 m from the ground. Mark the branch with flagging tape. The labels on all trees should be at about the same height and the same exposure to aid in future identification.

*Cutting Selection*

Cuttings should be taken from the upper two-thirds portion of the tree. Arrows in Fig. 2 indicate which twigs would make suitable cuttings. Cuttings taken from the lower portions of the tree will root, but will exhibit topophysis, or prostrate rather than upright growth.

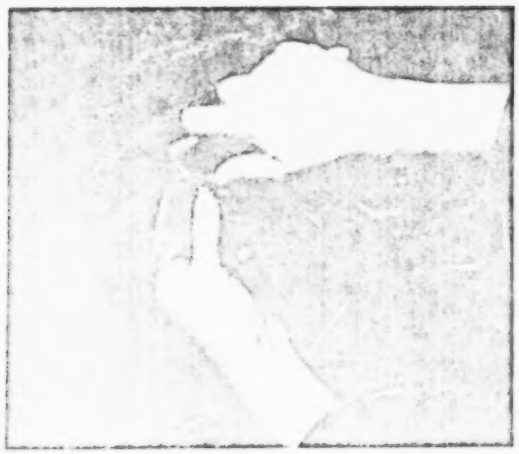
Ideal cutting length is 7-10 cm, although larger and smaller cuttings are still satisfactory. Choice cuttings are current year lateral shoots with a heel of old wood (Fig. 3, right) from near the tips of the side branches.

If the cutting is inadvertently taken too low in the crown or if it is taken too near the bole in the middle crown, the break between 1- and 2-year-old wood is often difficult to discern (Fig. 4, right). Two-year-old material roots poorly.

Be sure there is a healthy bud on the cutting (Fig. 4, left). If a bud appears to be abnormally swollen (Fig. 5), dissect it to see if the needle primordia are white and if there is an orange worm (spruce bud midge) at the heart of the bud (Fig. 6). Remove any such infected buds, and keep the cutting only if a healthy bud is still present.

*Collection and Storage*

A sharp cutting tool must be used to collect the cuttings. Any gum that builds up on the cutting edge should be removed with alcohol or a gum-solvent. If a scalpel or knife is used, tape the thumb of your cutting hand with adhesive bandages prior to starting.



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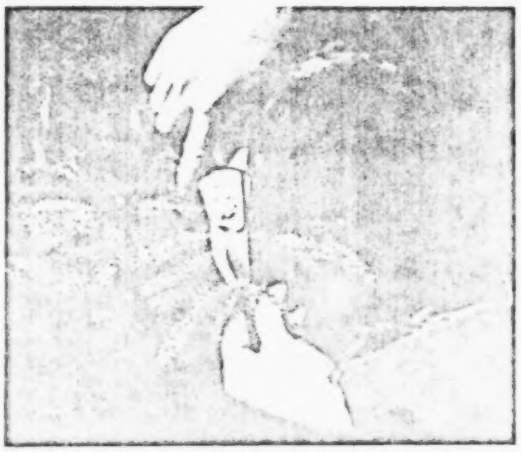

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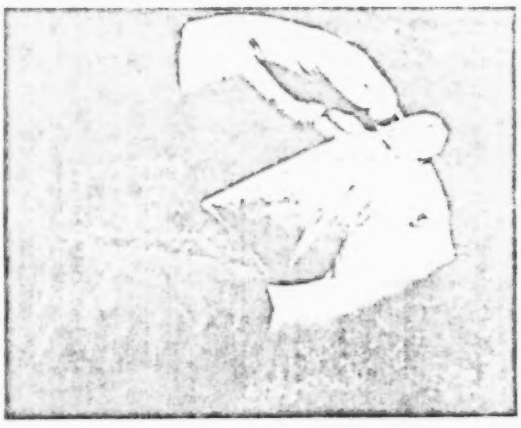

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*All photographs by J. Robinson*

Make the cut at the base of the current year's growth, including a heel of old wood (Figs. 7 & 8). Place the cuttings in a small plastic bag containing wet peat moss and an identifying label (Fig. 9). Try to place the cut ends into the moss.

If collecting cuttings from a nursery stool, the label should have the same identify code as the tree from which the cuttings are taken.

If collecting cuttings in natural stands or plantations, identify cuttings by species, District code and number on tree.

When the cuttings for one tree have been taken, tie the bag with an elastic band (Fig. 10) and place it in the cooler. If it is not practical to carry the cooler from tree to tree, use a large plastic bag to hold the collections, but be sure that the cuttings collected are always kept in the shade. This is absolutely essential to avoid heating.

Keep the cuttings at 2-5° C until ready for shipping. If possible ship by fast refrigerated freight (2-5° C shipping temperature). Always notify the receiver of estimated time of arrival so that the cuttings can be properly treated upon arrival.